

## Patent Claims

1. A method for the detection of posttranslational modification activities, characterised by the utilisation of protein fragments or polypeptides as sensors created from amino acid residues (moieties 1, 2) which possess a series of charged residues, and a recognition site containing modification residue(s) X and displaying a molecular electrostatic potential distribution, whereby the electrostatic potential distribution is measured as a dipole moment, enzymes are added to the sensor, the dipole moment is measured for a second time and a variation in the electrostatic potential and therefore dipole moment represents the detection of posttranslational modification activities.
2. A method based on claim 1 in which amino acid residues (moieties 1, 2) are present in a quantity from 0 to n and possess a series of charged residues.
3. A method based on claim 1 in which the recognition site in combination with the modification residue / modification residues (X) represents a recognition group only permitting the conversion of the modification residue through the specific proteins kinase or phosphatase.
4. A method based on claim 1 in which the amino acid residues (moieties 1, 2) in combination with the recognition site and modification residue / modification residues (X) display a three-dimensional structure with a distribution of molecular electrostatic potential and molecular dipole moment as prescribed by the manufacturer.
5. A method based on claims 1 to 4, in which the synthesized protein fragments are either dissolved in a solution or placed on a solid body (5).
6. A method based on claim 1 in which a change in the molecular electrostatic potential distribution of the protein fragment as a consequence of posttranslational modification activities is measured by the conversion of the electrostatic potential distribution into a different physical measurement unit and is indicated as such, and in which the electrostatic potential distribution in the altered dimensions of the different physical measurement unit is measured and/or recorded.
7. A method based on claims 1 and 6 in which posttranslational modification activities are determined on the basis of a differential capacitance measurement through the measurement and/or recording of the changes as  $\Delta U$ .

8. Electronic system based on claims 1, 6 and 7 in which an integral part consists of measuring equipment suitable for the supply of differential measurement results which can calculate the difference in the alterations, to which if necessary a differential amplifier (15) may be connected on the load side, followed by an alternating-current/direct-current converter (16).
9. Electronic system for the implementation of the method based on claims 1, 6, 7 and 8 in which changes resulting from modification activities are converted by means of existing components into analogue physical measurement results, and in which these components are connected on their load side with an analogue-to-digital converter for the purpose of digital evaluation.